

SVKM's
D. J. Sanghvi College of Engineering

Program: B.Tech in Computer Engineering

Academic Year: 2022

Duration: 3 hours

Date: 21.01.2023

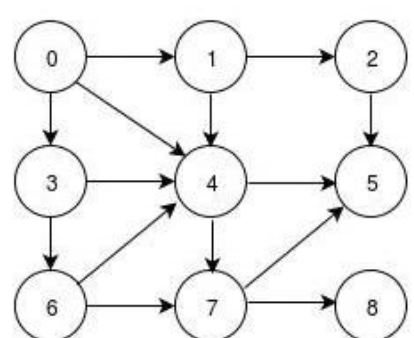
Time: 09:00 am to 12:00 pm

Subject: Data Structures (Semester III)

Marks: 75

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover page of the Answer Book, which is provided for their use.

- (1) This question paper contains two pages.
- (2) **All Questions are Compulsory.**
- (3) All questions carry equal marks.
- (4) **Answer to each new question is to be started on a fresh page.**
- (5) **Figures in the brackets on the right indicate full marks.**
- (6) **Assume suitable data wherever required, but justify it.**
- (7) Draw the neat labelled diagrams, wherever necessary.

Question No.		Max. Marks
Q1 (a)	Implement circular linked list with following functions: create insert before, display and main.	[10]
Q1 (b)	Implement Binary Search.	[05]
	OR	
Q2 (a)	Implement Selection sort.	[05]
	OR	
Q2 (b)	Implement polynomial addition using Linked list.	[10]
	OR	
Q3 (a)	Implement Input Restricted Deque.	[10]
	OR	
Q3 (b)	Explain difference between Linked list and Array.	[05]
	OR	
Q4 (a)	Implement conversion of an infix expression to postfix expression .	[10]
	OR	
Q4 (b)	Explain Topological sorting with the help of an example.	[05]
	OR	
Q4 (c)	Explain Expression tree with the help of an example.	[05]
	OR	
Q4 (d)	Implement BFS traversal of a graph. Apply BFS to show all the steps for traversal of the following graph assuming starting vertex as 0.	[10]
		[08]

	<p style="text-align: center;">OR</p> <p>Implement following functions in a Binary Search Tree</p> <ul style="list-style-type: none"> • deletion of a node • inorder display of all nodes 	<p style="text-align: right;">[08]</p> <p style="text-align: right;">[10]</p>
Q4 (b)	<p>What is hashing? Hash the following data in table of size 10 using linear probing and quadratic probing. Also find the number of collisions.</p> <p>63, 84, 94, 77, 53, 87, 23, 55, 10, 44</p>	[07]
Q5 (a)	<p>Given the following Inorder and Preorder Tree, Generate binary tree for the same.</p> <p>Inorder: Z T P R Q B L J N X C A Y M</p> <p>Preorder: J P Z T B Q R L A X N C M Y</p> <p style="text-align: center;">OR</p> <p>Demonstrate step by step insertion of the following element in an AVL tree.</p> <p>10, 52, 5, 25, 13, 17, 70, 60, 34, 40. Mention the type of imbalance if any</p>	<p>[10]</p> <p>[10]</p>
Q5 (b)	<p>Explain different types of data structures. Given an array int a[] = {69, 78, 63, 98, 67, 75, 66, 90, 81}. Calculate address of a[5] if base address is 1600.</p>	[05]